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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,398	10/17/2003	Andrei Colibaba-Evulet	131553-1	2881

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EXAMINER

LAWRENCE JR, FRANK M

ART UNIT	PAPER NUMBER
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1797

MAIL DATE	DELIVERY MODE
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10/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/689,398

Applicant(s)

COLIBABA-EVULET, ANDREI

Examiner

Frank M. Lawrence

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-84 is/are pending in the application.
- 4a) Of the above claim(s) 30-52 and 54-80 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 and 53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-80 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group 1, claims 1-29, 53 and 64 in the reply filed on August 31, 2007 is acknowledged. The traversal is on the ground(s) that Groups 1 and 2, and Groups 3 and 4 (prior Groups 2 and 3) are part of respective single inventive concepts. This is not found persuasive because the tank of Group 2 can be used for storing other gases such as helium and oxygen (see Rodriguez et al, U.S. Patent No. 5,653,951, col. 8, lines 34-39). Also, the vapor deposition system of Group 4 can be used to make other chemical compounds. Additionally, while the search and examination of the various groups partially overlap, there would be a serious burden on the examiner to search the non-overlapping areas. Note that claim 64 is considered to be part of Group 3 for examination. It appears that the claim dependency is a typographical error and that it should depend from claim 54. The species restriction has been with drawn and all of claims 1-29 and 53 are being examined.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 13 (paragraph 36), 30 (paragraph 26).
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 24, 28. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in

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reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4, 8-10, 13-16, 18, 20-25 and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Klos et al. (6,432,176).

6. Klos et al. '176 teach a hydrogen fuel system comprising a storage tank (11) containing carbon nanostructures for storing hydrogen, a fuel cell for operating a vehicle engine by using the stored hydrogen, an outlet pipe (14) for charging or discharging hydrogen from the tank, a cooling jacket (43) for heating or cooling the hydrogen storage material to facilitate charging or discharging, a source of heating or cooling fluid for supply to the jacket, a source of compressed gas for charging the tank, and a temperature sensor (16) inside the vessel (see figure 1, col. 3,

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lines 7-52, col. 4, lines 28-34, col. 10, lines 26-59, col. 11, line 18 to col. 12, line 29). The vehicle engine would inherently generate heat, and a control system is necessary for determining whether heating or cooling fluid should be supplied to the jacket.

7. Claims 1-6, 8-11 and 13-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Redmond (2004/0016769 A1).

8. Redmond '769 teaches a hydrogen fuel cassette system comprising a storage cassette (110) containing carbon nanostructures for storing hydrogen (figures 5, 8A, abstract, paragraphs 54, 68), a hydrogen utilization system such as a hydrogen/oxygen fuel cell, internal combustion engine, or hydrogen powered heater (paragraphs 59-62), a valve system for charging or discharging hydrogen from the cassette (paragraphs 64-65), a cooling pipes (520A, 520B) that facilitate hydrogen charging into the storage material (paragraphs 77, 87), electrical resistance-type heating elements for heating the hydrogen storage material to facilitate discharging hydrogen (paragraphs 70-71, 80), a source of pressurized hydrogen for charging the cassette (paragraph 82), and a temperature sensor and control system for regulating the heating and cooling of the storage material (paragraphs 77, 80-81). A cooling system inherently present in a vehicle powered by the hydrogen utilization system anticipates the limitation of claim 19.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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10. Claims 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of Klos et al. '176 or Redmond '769 in view of Hussain et al. (2002/0117123 A1).

11. Any one of Klos et al. '176 or Redmond '769 discloses all of the limitations of the claims except that the converter is a turbine. Hussain et al. '123 disclose that hydrogen fuel can be used as an alternative to petroleum for operating internal combustion engines and turbines in vehicles (see paragraphs 2 and 3). It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize the hydrogen fuel system of any one of Klos et al. '176 or Redmond '769 with a turbine propulsion system in order to provide a vehicle that does not produce air pollution.

12. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over any one of Klos et al. '176 or Redmond '769 in view of Rodriguez et al. (5,653,951).

13. Any one of Klos et al. '176 or Redmond '769 discloses all of the limitations of the claims except that the storage container includes a metal capable of acting as both a seed for the formation of the nanostructured material and a facilitator for promoting hydrogen storage. Rodriguez et al. '951 disclose a hydrogen storage material including carbon nanostructures and a metal such as Pd, Pt or Fe (see abstract, col. 8, lines 41-49). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the storage material of any one of Klos et al. '176 or Redmond '769 by including a metal to provide a means for dissociatively absorbing hydrogen.

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Conclusion


14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional references listed on the attached PTO-892 form disclose hydrogen storage systems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank M. Lawrence whose telephone number is 571-272-1161. The examiner can normally be reached on Mon-Thurs 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Frank M. Lawrence
Primary Examiner
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10-11-07

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